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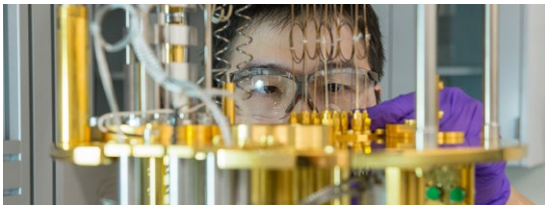
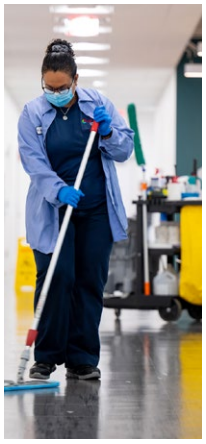
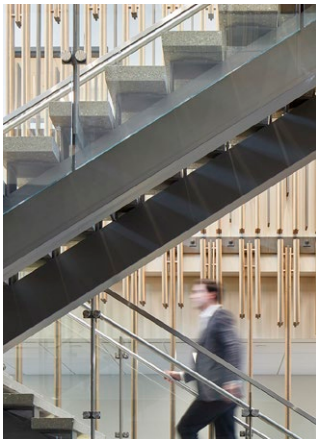






OUR PATH FORWARD

A 2021 GUIDE FOR THE ARGONNE TEAM

UChicago Argonne, LLC

U.S. DEPARTMENT OF ENERGY

Argonne National Laboratory is a U.S. Department of Energy laboratory managed by UChicago Argonne, LLC.

Dear colleagues,

It has been 75 years since Argonne was founded as one of America's first national laboratories. As we look forward to the next 75 years, we continue to fulfill the mission that has guided us since our founding: accelerating the science and technology that drives American prosperity and security.

Our research makes a difference. Argonne is recognized internationally for pioneering discoveries in multiple fields of research and technology innovations that are embraced by industry and that make a difference in the lives of many.

Argonne's strategy for the future will establish new research strengths and extend our impact in the world. We will execute this strategy through our core research programs, scientific user facilities, multi-institution centers, and transformational research initiatives. As has been the case since our founding, our research and operations partnership with the University of Chicago will enrich our strategy.

Our commitment to leadership in science and technology is matched by an equal commitment to operational excellence and a diverse, world-class community of talent. Argonne's culture rests on a solid foundation of five core values: Impact, Safety, Respect, Integrity, and Teamwork.

The following pages summarize our strategy and goals as recently presented to the U.S. Department of Energy as part of the Department's annual planning process for national laboratories. These goals are defined and refined through an ongoing process that involves staff and leaders from across Argonne. I am excited to work with you as we continue to expand our possibilities and forge new directions.

Paul K. Kearns

PAUL K. KEARNS
Laboratory Director

Leadership in Science and Technology

Argonne is distinguished as a national laboratory by the breadth, depth, and impact of our research. We are convenors and collaborators, building world-leading teams that push forward the scientific horizon and deliver energy and national security solutions.

Our rich and diversified research and development portfolio positions Argonne for continued leadership:

- Our discovery science unravels the deepest mysteries in the physical and life sciences to more fully understand the world around us.
- Through energy and climate R&D, we develop technologies to meet clean energy needs and produce new understanding of climate processes through modeling and observation.
- We strengthen global security, with a focus on protecting American infrastructure and society from nuclear, radiological chemical, and biological threats.
- Our unique and rich suite of user facilities brings thousands of scientists and engineers from around the world to Argonne to perform groundbreaking research.

To fulfill our mission, we define ambitious goals for our laboratory and continually enhance our capabilities to be of even greater benefit to society. The future strength of our science and technology portfolio will be grounded in our expertise and facilities in six research domains. They are:

- Physical science, which spans chemistry, materials science, and nuclear and particle physics. Argonne's research in these disciplines gives groundbreaking insights into the physical world from the cosmos to the subatomic.
- Biological and environmental research, which ranges from climate and atmospheric science to biological and bioprocess engineering. Through these capabilities, Argonne brings Earth systems front and center in addressing global issues.
- Engineering, which includes chemical, materials, nuclear, and systems engineering as well as nuclear and radiological chemistry. We advance energy and manufacturing technologies that reduce carbon emissions and bolster American industry.
- Computation, which encompasses advanced computer, visualization, and data science; applied mathematics; computational science; and cyber and information science. We put these capabilities to work to drive breakthroughs in artificial intelligence (AI), scientific computing, and cybersecurity.
- Decision science and analysis, which equips public- and private-sector leaders with sophisticated methods to inform complex policy and operational choices.
- Experimental facility design and operation, which advances accelerator science and technology and delivers large-scale user facilities for computing, climate science, nuclear physics research, and the exploration of physical and biological systems using x-rays and nanoscience.

We extend our capabilities by collaborating extensively with universities, industry, and other national laboratories. We are proud to lead hundreds of researchers in five major public-private partnerships that will help the nation overcome critical challenges in energy and materials:

- Advanced Materials for Energy-Water Systems center
- Joint Center for Energy Storage Research
- Midwest Integrated Center for Computational Materials
- Q-NEXT quantum information science center
- ReCell advanced battery recycling center

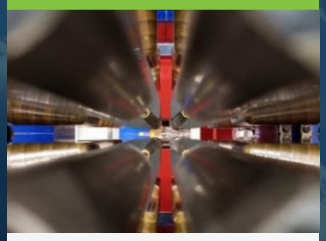
MAJOR USER FACILITY UPGRADES

Advanced Photon Source (APS)
Upgrade underway to deliver vastly more powerful x-ray beams that will transform researchers' ability to understand and manipulate matter at the atomic level in real time. "First light" after the upgrade is expected in 2024.

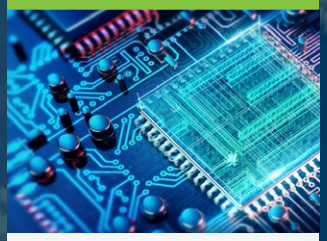
Argonne Leadership Computing Facility (ALCF)
Aurora, a supercomputer with exascale speed, will give users an unprecedented suite of capabilities in AI, modeling, and simulation, beginning in 2022.

MAJOR RESEARCH INITIATIVES

We are extending our capabilities to boost our impact on science and society.



Hard X-ray sciences, which will revolutionize experimental methods to enable users to fully capitalize on the capabilities of the upgraded APS, including control of experiments and data flows via edge computing and ALCF supercomputers.



AI for science, which will create an AI capability specifically designed to open new vistas in scientific and engineering research, anchored by Aurora and future ALCF systems, while building the AI workforce of the future.

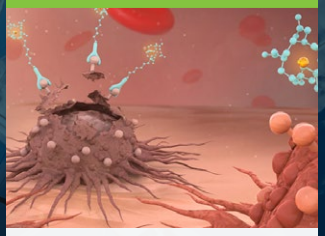
Autonomous discovery, which will develop and deploy large-scale "self driving" experimental laboratories that greatly accelerate research progress and can be used to attack problems that currently are beyond human reach.

Universe as our laboratory, which will develop novel capabilities to probe the fundamental nature of energy and matter, elucidating some of the most important mysteries in nuclear and particle physics.

Quantum information, which will harness the power of quantum phenomena across Argonne's portfolio of discovery science to achieve significant near-term advances in quantum sensing, simulation, and networking.

Climate and energy action, which will re-imagine energy storage as a pathway to a decarbonized economy and deliver powerful modeling and analytical tools that help society better predict and adapt to climate change.

Science for a circular economy, which will, through basic research, create materials and chemistries that can ultimately enable high-value re-use of products, reduce needs for scarce resources, and preserve the environment.



Radioisotope discovery, which will advance the accelerator-based production of radioisotopes for medical applications, with a focus on more effective and less toxic radioisotopes for the diagnosis and treatment of cancer.

OUR ECONOMIC IMPACT

Argonne is committed to contributing to national and regional economic prosperity through inclusive innovation partnerships.

Argonne purchases more than $60 million annually in goods and services from small businesses in our eight-state Great Lakes region. Our office in the City of Chicago provides a focal point for outreach to regional industry and emerging initiatives in place-based innovation.

Argonne researchers work with industry counterparts nationwide to accelerate commercialization of companies' new technologies through a host of DOE-sponsored grants, programs, and consortia. As one example, our DOE-supported Chain Reaction Innovations entrepreneurship program, now in its fifth year, has guided 26 start-ups that so far have created 215 jobs and raised $89 million in funding.

We also actively seek to license Argonne inventions to the private sector to drive job creation. We support our internal innovators with a Lab-to-Market program that provides internal investment in technology maturation and access to entrepreneurial programs.

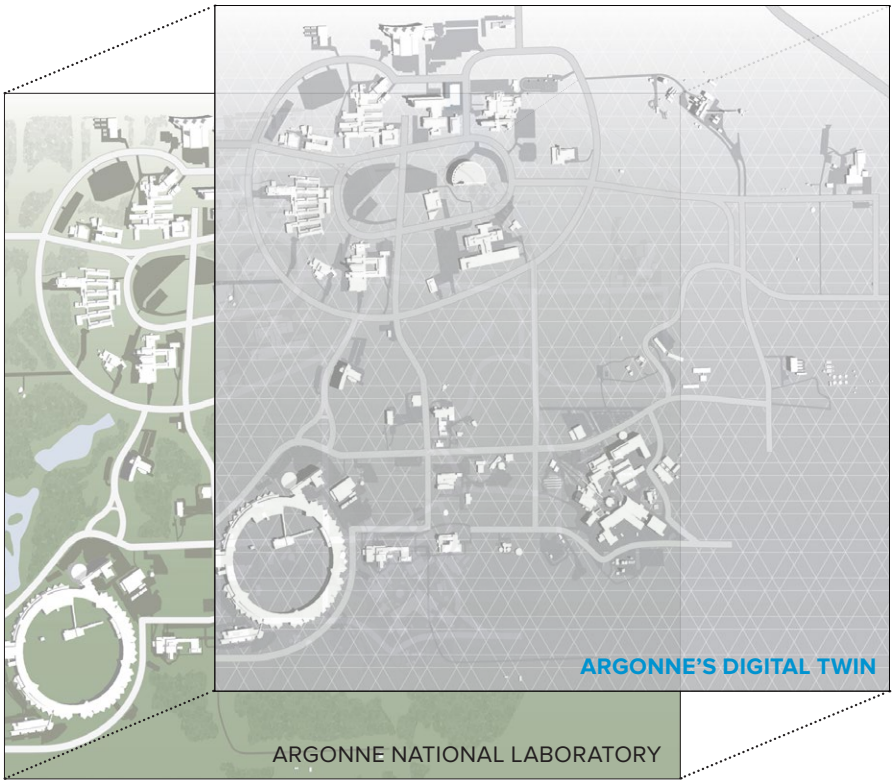
Operational Excellence

We are committed to delivering exemplary operations support to enable Argonne's leadership in science and technology. Our operations team aspires to be the best partner to advance Argonne's impact, by applying the principles of customer satisfaction, simplification, transparency, and accountability.

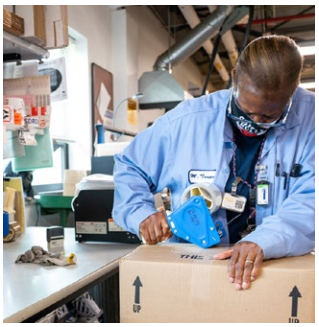
Our overall goals are to balance safety, security, and risk; modernize Argonne's infrastructure and business systems; enable informed decision-making; and achieve quality, effectiveness, and efficiency. In partnership with Argonne researchers, operations leaders are now using AI tools to help achieve those goals.

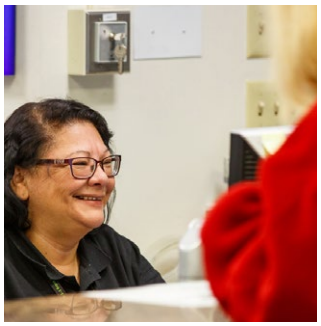
Resiliency and sustainability serve as guiding principles for the modernization of Argonne's physical infrastructure. We also seek to achieve net-zero carbon emissions from our site by 2035, with our planning informed by a "digital twin" of Argonne's infrastructure.

Across the Laboratory's operations, we work continually to enhance the effectiveness of the processes and systems we use to make decisions; work safely; manage our finances; steward our digital, intellectual, and property resources; procure goods and services; and communicate internally and externally.



A "digital twin" model of Argonne's infrastructure allows us to simulate the impact of alternative decarbonization actions and identify the most effective investments.





World-Class Community of Talent

A world-class community of talent is foundational to Argonne's long-term success in research and operations. We are committed to continually building a safe, equitable, diverse, and inclusive work environment grounded in our core values.

We recruit broadly to increase diversity in our highly skilled workforce, with an emphasis on building diverse slates of candidates and teams of interviewers. We are creating more opportunities for advancement, for all employees, through expanded mentoring and succession planning, as well as learning opportunities that develop leadership and professional skills.

We are acting to create and sustain a climate in which all employees feel valued, supported, and included. We celebrate employees' successes, work with our employee resource groups to build a sense of community, and address the work-life needs of a hybrid workforce.

We encourage employees to contribute to our diversity, equity, and inclusion (DEI) councils; hold leaders accountable for DEI progress; resolve workplace concerns through our ombuds program; and work to proactively prevent harassment.

To grow the nation's future STEM leaders and workers, our learning programs for pre-college students are giving new emphasis to disadvantaged communities in Chicago. We provide ever-increasing opportunities for university students in competitions and employment with Argonne, and we are expanding job and mentoring opportunities for post-doctoral researchers.

Argonne is managed by UChicago Argonne, LLC, for the U.S. Department of Energy (DOE) Office of Science.

We are one of 17 DOE national laboratories that together form a world-leading research system. Each laboratory leverages its unique capabilities to solve particularly difficult problems that individual companies or universities cannot address alone, with a focus on national priorities.

In fiscal year 2020, Argonne employed 3,400 people, drawn from scores of scientific, technical, administrative, and operations fields. We also provided national scientific user facilities that supported 6,700 researchers.

Our fiscal year 2020 funding was $1.2 billion, nearly 90% of which came from DOE and the balance from the Department of Homeland Security, other government agencies, and the private sector.

FOR MORE INFORMATION
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